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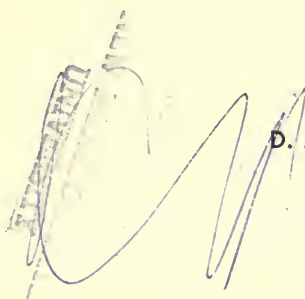
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ILLINOIS COUNTRY GRAIN ELEVATOR FINANCIAL ORGANIZATION AND OPERATION

A 1961-62 study



D. A. Storey and R. A. Gillfillan

BULLETIN 702

UNIVERSITY OF ILLINOIS AGRICULTURAL EXPERIMENT STATION

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ILLINOIS COUNTRY GRAIN ELEVATOR FINANCIAL ORGANIZATION AND OPERATION, 1961-62

D. A. STOREY and R. A. GILLFILLAN¹

ILLINOIS COUNTRY GRAIN ELEVATOR FIRMS operate in a highly competitive and constantly changing environment. Adjustments in financial organization and operation are often necessary, both to provide the most efficient services for customers and to maintain or increase the profits generated by the business. The purpose of this study is to help elevator owners, directors, and managers evaluate the current situations of their own businesses by providing them with comparative statistics and information about recent adjustments made by similar firms. To do this, the study: (1) presents accounting data for 1961-62, (2) evaluates the reasons for differences among firms, and (3) makes comparisons with two earlier years, 1949-50 and 1954-55.

DATA

Sources

The approximately 1,200 known grain elevator firms were asked by mail if they would be willing to cooperate in the study. About 210 firms answered affirmatively and were visited during the summer of 1962. Information was taken from accounting records that covered years ending during the period from July 31, 1961, through June 30, 1962.

Of the records collected, 168 were sufficiently detailed for use in the study. The 168 firms included (Fig. 1) actually operated about 250 elevator stations, counting two plants in different towns as two separate stations, but two plants in the same town as one station. One hundred of the firms were cooperatives and 68 were privately owned.

Two points about the data should be made clear. The sample was not a random one, since it was based on the willingness of the firms to cooperate and on the completeness of their accounting records. Therefore, it cannot be said that the sample represents a cross section of the elevator population of the state. Also, the data do not refer to one 12-

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Location of elevators included in the 1961-62 study. (Fig. 1)

month period, but to a combination of 12-month periods ending at any time from July 31, 1961, to June 30, 1962, depending on the accounting year of the firm. Accounting year ending dates were distributed as follows.

Ending date	Number of firms	Ending date	Number of firms
July 31, 1961.....	4	January 31, 1962.....	5
August 31, 1961.....	14	February 28, 1962.....	6
September 30, 1961.....	2	March 31, 1962.....	5
October 31, 1961.....	2	April 30, 1962.....	7
November 30, 1961.....	9	May 31, 1962.....	26
December 31, 1961.....	70	June 30, 1962.....	18

Standardization

Before the data were analyzed, items were classified in the same way for all elevators, regardless of the firm's original accounting procedure. For example, interest expense was classified as a nonoperating expense for all firms, even though some classified it as an operating expense in their own records, and prepaid expenses were classified as current assets in all cases, although some firms originally classified them as "other" assets.

Some privately owned elevators did not include in expenses a charge for the owner-manager's time. So that these firms could be

compared more uniformly with firms having salaried managers, a manager's compensation equal to the average salary paid to managers in similar elevators was added to their expenses.

Elevator groupings

The 168 firms were divided into nine groups, according to volume of total sales plus service income¹ and to percent of total sales that was grain (Table 1). These groups are identified by both letters and numbers. All firms in which grain sales were less than 75 percent of total sales (grain and merchandise) are the A group; all those in which grain sales were 75 to 89 percent of total sales are the B group; and all

Table 1. — Elevator Groupings Used

Firms classified by percent that grain was of total sales (grain and merchandise)	Firms classified by volume (total sales plus service income)			Total
	Group 1 firms; volume under \$750,000	Group 2 firms; volume \$750,000 to \$1,500,000	Group 3 firms; volume over \$1,500,000	
	<i>number of firms</i>			
Group A: sales under 75 percent grain..	18	11	11	40
Group B: sales 75 to 89 percent grain...	14	26	19	59
Group C: sales 90 to 100 percent grain..	23	29	17	69
Total.....	55	66	47	168

Note: letters and numbers are used to identify groups. For example, in Group A1 the firms had grain sales that were less than 75 percent of total sales (grain and merchandise), and volume (total sales plus service income) that was under \$750,000.

those in which grain sales were 90 to 100 percent of total sales are the C group. Each of these three groups was subdivided into three groups, 1, 2, and 3, according to volume (total sales plus service income). All firms in which volume was under \$750,000 are in Group 1; all those in which volume was \$750,000 to \$1,500,000 are in Group 2; and all those in which volume was over \$1,500,000 are in Group 3. Such groupings make cross-classification possible. For example, all firms in which grain sales were less than 75 percent of total sales and in which volume was under \$750,000 are in Group A1.

The group averages are useful as management guides, because they permit comparisons among elevators similar in type and size.

¹ It is not entirely consistent to add income from sales of grain and merchandise to income from services performed to get a measure of volume of operation. However, it was judged less misleading to add these figures than to ignore the effect of service income on business volume.

Method of analysis

The group averages resulting from the classifications just described and given in Table 1 were used to give rough indications of the relationship between sales and service volume, proportion of sales that was grain, and other selected variables such as net operating income, or operating expense. More precise indications were given by multiple regression analyses of the relationships between the selected variables and grain sales, merchandise sales, and service income.

Nonquantifiable variables such as the region of the state were also considered. In these cases, analysis of variance was used to examine the degree of relationship among variables.

A word of caution must be given the reader at this point. Group averages were frequently used in the study with the intention of providing statistics for comparative purposes. But the differences among group averages were not significant in a statistical sense unless statistical tests were specifically mentioned.

ELEVATOR OPERATIONS, 1961-62

Summary of incomes and expenses

For the average elevator in the study, total sales plus service income were \$1,283,577, and 83 percent of its sales was grain (Table 2). Its gross operating income was \$109,739; its operating expenses were \$82,317; its net operating income was \$27,423; and its net income (after adjustments for nonoperating income and expense) was \$26,188. Incomes and expenses varied considerably among elevator groups and among individual elevators. These differences will be examined in detail in the discussion that follows.

Net incomes and net operating incomes

In theory, the management of a firm attempts to maximize net income — the larger the net income, the more successful the firm. In this study, the closely related figure of *net operating income* is used as a measure of success. It reflects operational efficiency somewhat more accurately than net income, because net income is affected by nonoperating income and expenses. Nonoperating income and expenses vary depending on the amount of borrowed capital, outside investments, chance gains or losses, and so on. Net operating income represents the return to the total capital used in the business. Any amount earned that is above a normal interest charge for capital used is what is generally called pure profit.

Among elevator groups, average net operating income varied from

\$7,038 (Group B1) to \$86,746 (Group A3) (Table 2). Among individual elevators, net operating income ranged from a loss of \$56,000 to a profit of \$255,000 (Fig. 2). Net operating income tended to increase with increasing volume, but for any given volume, there was a wide range of net operating incomes realized. Net operating incomes also tended to be larger as the percent of merchandise to total sales was larger, but again a wide range prevailed at any given level.

Total sales plus service income is a rather gross volume figure on which to base an analysis, because it can be made up of varying proportions of grain and merchandise sales and service income. For this reason, a linear multiple regression analysis was made,¹ considering grain sales, merchandise sales, and service income as separate variables.

The analysis indicated that in the elevators studied net operating income increased 0.9 cent for every \$1.00 increase in grain sales, increased 5.3 cents for every \$1.00 increase in merchandise sales, and increased 37.9 cents for every \$1.00 increase in service income. The equation, however, explained only two-thirds of the variation in net operating income and the standard error, which is a measure of reliability, was quite large.

There are several possible explanations of why the analysis does not more accurately explain differences in net operating income. The equation used was a simplified form that requires the partially unrealistic assumption that income increases as a constant proportion of increases in business volume. It is likely that there are economies of size and scale in expenses, and it is possible that margins may vary with size, too. In addition, if the factors were broken down further, such as grain sales into corn, oats, soybean, and wheat sales, the accuracy of the equation might be improved.

Other things that cannot be measured by quantity may be related to net operating income. The effects of two of these, location² (region of

¹ The linear multiple regression analysis gave the following result:

$$X_1 = -7.992 + .00882X_2 + .05317X_3 + .37913X_4$$

(.00244) (.00523) (.05150)

$$R = .81570$$

$$S = 19.908$$

Where: X_1 = net operating income (in thousands of dollars)

X_2 = grain sales (in thousands of dollars)

X_3 = merchandise sales (in thousands of dollars)

X_4 = service income (in thousands of dollars)

R = coefficient of multiple correlation

S = standard error of estimate for the equation (in thousands of dollars)

Standard errors of the regression coefficients are shown in parentheses. All the coefficients were significant at the one-percent level.

² In different regions of the state, different types of farming, different grain sales, different elevator practices, and different competitive conditions may affect elevator net operating incomes. For a further discussion of this subject and for identification of the different regions used in the analysis, see pp. 15-17.

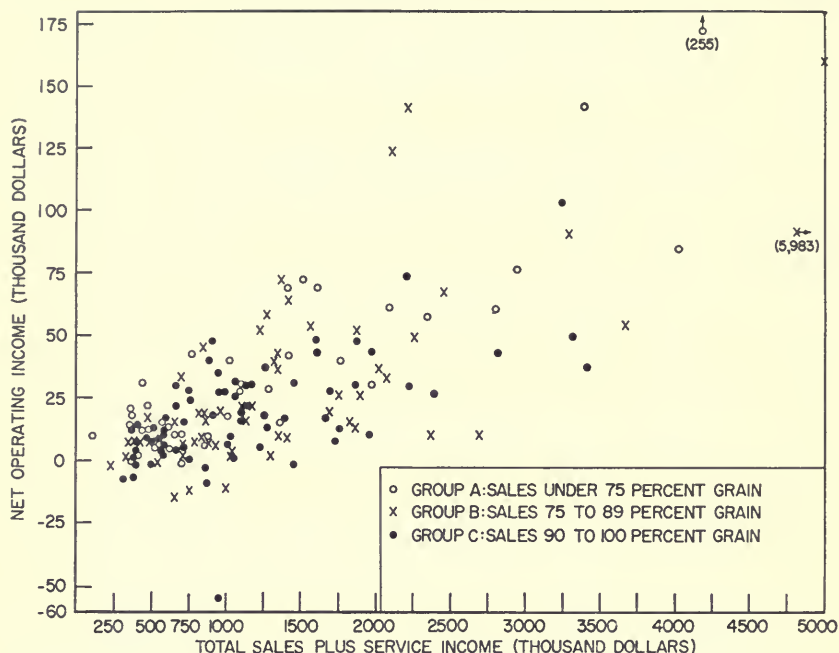
Table 2. — Summary of Income and Expense; 168 Elevators Classified by Volume (Total Sales Plus Service Income) and by Percent of Total Sales (Grain and Merchandise) That Was Grain; Group Averages

Item	Group A: sales under 75 percent grain			Group B: sales 75 to 89 percent grain			Group C: sales 90 to 100 percent grain		
	Group A1 firms; volume under \$750,000	Group A2 firms; volume \$750,000 to over \$1,500,000	Group A3 firms; volume over \$1,500,000	Group B1 firms; volume under \$750,000	Group B2 firms; volume \$750,000 to over \$1,500,000	Group B3 firms; volume over \$1,500,000	Group C1 firms; volume under \$750,000	Group C2 firms; volume \$750,000 to over \$1,500,000	Group C3 firms; volume over \$1,500,000
Grain sales.....	\$273,362	\$639,397	\$1,569,760	\$421,610	\$874,802	\$2,066,527	\$494,486	\$991,195	\$2,077,855
Grain cost of sales ^a	262,510	618,065	1,513,892	410,831	847,620	1,996,393	481,258	962,011	2,007,740
Grain gross income.....	10,852	21,332	55,868	10,779	27,182	70,134	13,228	29,184	70,115
Merchandise sales.....	196,185	455,331	1,002,122	82,372	191,133	408,587	18,527	47,421	80,470
Merchandise cost of sales ^b	161,930	375,458	831,953	70,165	162,625	346,057	16,431	40,505	69,566
Merchandise gross income	34,255	79,873	170,169	12,207	28,508	62,530	2,096	6,916	10,904
Service income.....	23,404	23,938	43,855	25,782	36,842	90,737	22,136	31,867	47,373
Other operating income ^c ..	67	5,376	30,741	52	607	4,362	269	59	197
Gross operating income..	68,578	130,519	300,633	48,820	93,139	227,763	37,729	68,026	128,589
Operating expenses.....	57,255	100,276	213,887	41,782	70,778	170,722	29,337	50,782	89,793
Net operating income....	11,323	30,243	86,746	7,038	22,361	57,041	8,392	17,244	38,796
Nonoperating income ^d ...	1,397	1,572	9,586	341	1,977	3,259	292	698	1,470
Nonoperating expenses ^e ..	2,189	1,997	4,850	1,934	2,792	8,958	1,556	2,022	2,727
Net income.....	10,531	29,818	91,482	5,445	21,546	51,342	7,127	15,920	37,539

Table 2. — Concluded

Item	All Group A firms	All Group B firms	All Group C firms	All Group 1 firms	All Group 2 firms	All Group 3 firms	Average, all groups
Grain sales.....	\$ 730,532	\$1,151,041	\$1,093,353	\$403,568	\$886,710	\$1,954,360	\$1,027,226
Grain cost of sales ^a	704,418	1,113,919	1,059,404	391,741	859,623	1,887,572	994,029
Grain gross income.....	26,114	37,122	33,949	11,827	27,087	66,788	33,197
Merchandise sales.....	489,083	235,352	45,932	92,921	172,020	428,818	217,967
Merchandise cost of sales ^b	404,907	199,756	39,640	77,727	144,439	359,769	182,840
Merchandise gross income.....	84,176	35,596	6,292	15,194	27,581	69,049	35,127
Service income.....	29,175	51,574	32,444	23,479	32,505	64,080	38,384
Other operating income ^c	9,962	1,684	163	148	1,161	9,029	3,031
Gross operating income.....	149,427	125,976	72,848	50,648	88,334	208,946	109,739
Operating expenses.....	112,160	96,083	53,245	41,642	66,908	151,552	82,317
Net operating income.....	37,267	29,893	19,603	9,006	21,426	57,394	27,423
Nonoperating income ^d	3,697	2,002	753	666	1,348	4,093	1,892
Nonoperating expenses ^e	2,868	4,574	2,040	1,859	2,322	5,743	3,127
Net income.....	38,096	27,321	18,316	7,813	20,452	55,744	26,188

^a Includes an adjustment for gain or loss on futures trading. In the average of all groups, the adjustment was \$143.^b Includes an adjustment for discounts received or paid. In average of all groups, the adjustment was —\$105.^c Recovery of bad debts and farm income.^d Includes interest income, dividends, rent, gain on investments or sale of fixed assets, cash over.^e Includes interest expense, loss on investments or sale of fixed assets, robbery or fire loss, cash short.



Relationship between net operating income and business volume (total sales plus service income). (Fig. 2)

the state), and type of business organization (private or cooperative) were analyzed. The results, however, did not indicate that differences in either factor had any measurable effect on net operating income.¹

For a given sales volume, net operating income varies as expenses and gross realized margins vary. Some managers are able to hold expenses lower than are others at a given sales volume. Some are able to realize higher gross margins at a given sales volume. These differences, which may be broadly termed differences in "management efficiency," are key explanations of differences in income.

Net operating income may be considered as a percentage of total sales plus service income, net assets, or net worth. These are measures of efficiency, relating net operating income to the volume of business, the total capital resources used, and the owners' investment.

For the average elevator, the \$27,423 net operating income was 2 percent of total sales plus service income, 11 percent of net assets, and

¹ Residuals were obtained by subtracting net operating incomes estimated in the equation from actual net operating incomes. There was not a consistent pattern for either location or type of business organization. Adding the average residual for each group to the regression equation did not significantly improve the fit of the regression equation (using the F-test).

13.2 percent of net worth (Table 3). The return per dollar of total sales plus service income seemed to vary more with variation in the percent of grain to total sales than with variation in volume. It was somewhat higher in the group of large firms (Group 3) than in the groups of smaller firms, but it was considerably higher in the group having the highest percentage of sales from merchandise (Group A) than in the other groups. The returns per dollar of total capital (net assets) and per dollar of owners' investment (net worth), however, appeared to vary more with variations in volume than with variations in the percent of grain to total sales. The percent that net operating income was of net assets was much higher in the group of large firms (Group 1) than in the groups of small firms, both in total and in each of the subgroups. A weaker and less consistent relationship appeared when percents of grain to total sales were compared. The tendency for the group with the lowest percent of sales from grain (Group A) to have the highest returns was only slight. When the percent that net

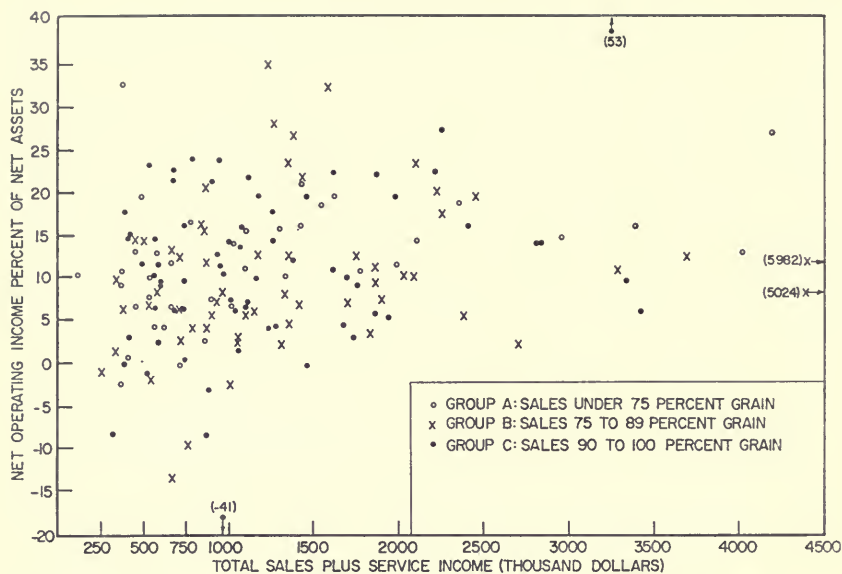
Table 3. — Net Operating Income, in Dollars and Percent; Group Averages^a

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Net operating income	Percent net operating income was of total sales plus service income	Percent net operating income was of net assets ^{b, c}	Percent net operating income was of net worth ^c
Group A: sales under 75 percent grain				
A1: volume under \$750,000	\$11,323	2.7	9.2	10.7
A2: volume \$750,000 to \$1,500,000	30,243	2.7	12.5	13.2
A3: volume over \$1,500,000	86,746	3.2	16.1	18.4
Group B: sales 75 to 89 percent grain				
B1: volume under \$750,000	7,038	1.3	5.5	7.1
B2: volume \$750,000 to \$1,500,000	22,361	1.9	11.1	12.6
B3: volume over \$1,500,000	57,041	2.2	12.4	14.5
Group C: sales 90 to 100 percent grain				
C1: volume under \$750,000	8,392	1.4	9.8	14.9
C2: volume \$750,000 to \$1,500,000	17,244	1.6	9.1	11.4
C3: volume over \$1,500,000	38,796	1.7	15.4	17.8
All Group A firms	37,267	2.9	12.1	13.6
All Group B firms	29,893	1.9	10.2	11.9
All Group C firms	19,603	1.6	10.9	14.1
All Group 1 firms	9,006	1.8	8.5	11.4
All Group 2 firms	21,426	1.9	10.5	12.2
All Group 3 firms	57,394	2.3	14.4	16.6
Average, all firms	\$27,423	2.0	11.0	13.2

^a The percent figures for group averages are averages of individual firm percentages.

^b Net assets equal total assets minus current liabilities.

^c Three firms, one in Group A1 and two in Group C1, did not have balance sheets and were not included in these averages.



Relationship between net operating income as a percent of net assets and business volume (total sales plus service income). (Fig. 3)

operating income was of net worth was compared, the same conclusions could be made, although not quite as strongly.

Variations among individual firms in the returns per dollar of net assets (Fig. 3) were wide. The variation was particularly wide among the smaller firms. However, the percent of return showed a tendency to increase with increases in business volume.

As previously mentioned, net operating income represents the return to capital used plus pure profit. Suppose an interest charge for capital used (for example, 5 percent of net assets) were deducted from the net operating incomes of all firms. The remaining pure profit would still vary greatly among firms, as Fig. 3 clearly shows. It is also obvious that the pure profit of the average small firm would be somewhat smaller as a percent of net assets and considerably smaller in dollars than the pure profit in the average large firm.

Incomes from grain elevators are comparable to those of other types of businesses. Net income after taxes averaged 8.7 percent of net worth for the 3,557 leading business corporations in the United States in 1961.¹ The average net income before taxes of elevators in this study

¹ "Monthly Letter, Business and Economic Conditions," The First National City Bank of New York, April, 1962.

was 13 percent of net worth. Information concerning income taxes was not collected, but even if the average elevator net income were reduced by one-half to allow for income taxes, net incomes would still be 6.5 percent of net worth. This reduction is actually too large, because some of the cooperative elevators in the study did not pay income taxes. Also, the income of many of the elevators was below the level at which the 52-percent tax rate applied.

Gross operating incomes

Gross operating income is composed of margins realized from the sales of grain and merchandise and gross income received for services performed. The relative importance of income from these sources varied among the elevator groups (Table 4). The percent that service income was of total gross operating income was much higher in the groups of small elevators, particularly those handling large percentages of grain. Variations in the relative importance of gross incomes from grain and merchandise corresponded with variations in grain and merchandise sales.

Gross margins realized on grain. For 138 firms, sufficient information was available to make it possible to calculate the gross margins

Table 4. — Breakdown of Gross Operating Income: Group Averages^a

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Percent of total gross operating income			
	Grain	Merchandise	Service	Other
Group A: sales under 75 percent grain				
A1: volume under \$750,000.....	17.0	50.4	32.5	0.1
A2: volume \$750,000 to \$1,500,000...	18.5	60.4	17.8	3.3
A3: volume over \$1,500,000.....	19.9	56.1	15.3	8.7
Group B: sales 75 to 89 percent grain				
B1: volume under \$750,000.....	21.5	25.3	53.1	0.1
B2: volume \$750,000 to \$1,500,000 ^b ..	30.5	31.4	37.3	0.8
B3: volume over \$1,500,000.....	32.9	28.6	36.9	1.6
Group C: sales 90 to 100 percent grain				
C1: volume under \$750,000.....	38.4	5.9	55.1	0.6
C2: volume \$750,000 to \$1,500,000...	46.1	10.9	42.8	0.2
C3: volume over \$1,500,000.....	53.8	9.4	36.6	0.2
All Group A firms.....	18.2	54.7	23.8	3.3
All Group B firms ^b	29.1	29.0	40.9	1.0
All Group C firms.....	45.4	8.8	45.4	0.4
All Group 1 firms.....	27.1	25.4	47.2	0.3
All Group 2 firms ^b	35.2	27.5	36.4	0.9
All Group 3 firms.....	37.4	28.1	31.7	2.8
Average, all firms.....	33.2	27.0	38.6	1.2

^a Averages of individual firm percentages.

^b One firm had a negative gross operating income and was not included in the averages.

realized per bushel of grain. The median margins (that is the middle point at which half the margins were lower and half were higher) were 2.9 cents per bushel for corn and oats, 5.6 cents for soybeans, and 5.8 cents for wheat (Table 5).

Table 5.—Gross Margins Realized; Cents per Bushel;
Four Major Grains; Percent of Firms^a

Gross margins realized; cents per bushel	Corn	Oats	Soybeans	Wheat
		<i>perct. of firms</i>		
Loss.....	3.6	6.0	.7	...
0-.9.....	2.9	7.5	.7	...
1.0-1.9.....	15.9	10.6	2.2	2.4
2.0-2.9.....	29.0	26.3	5.2	11.4
3.0-3.9.....	17.4	18.8	11.0	9.8
4.0-4.9.....	12.9	7.5	16.9	13.0
5.0-5.9.....	5.1	6.0	16.9	18.7
6.0-6.9.....	5.1	2.3	11.8	20.3
7.0-7.9.....	2.9	3.0	11.8	7.3
8.0-8.9.....	1.5	1.5	3.7	4.9
9.0-9.9.....	2.2	1.5	3.7	4.1
10.0-10.9.....	...	2.3	5.2	2.4
11.0-11.9.....	...	3.8	2.9	...
12.0.....	...	1.5	2.2	1.6
13.0.....	...	.7	2.2	.8
14.0.....	...	...	...	1.6
15.0 and over.....	1.5	.7	2.9	1.7
Average margin.....	3.4	3.7	6.3	6.0
Median margin.....	2.9	2.9	5.6	5.8

^a Based on information from 138 firms for corn, 133 for oats, 135 for soybeans, and 124 for wheat.

Variations in the margins realized by individual firms were wide, particularly for soybeans and wheat, as Table 5 indicates. Group medians (Table 6) suggest that margins were largest in the groups of large elevators (all Group 3) and smallest in the small elevator groups (all Group 1). Examination of the relationships for individual firms shows, however, that margins varied widely at all levels of sales volume for all four grains, as shown in Fig. 4 for corn.¹

Many factors may cause the grain margins realized to vary among firms. Prices received for grain vary, depending on when and where the grain is sold. Some grain is purchased at harvest and held for a post-harvest increase. The larger grain margin in this case may really be partly storage income, or it may be a reward for speculation. A gain or loss may be realized on the hedging of stored grain. The importance of local sales relative to shipments may influence the gross margins

¹ Since the patterns were so similar for all four grains, only the relationships for corn are shown here.

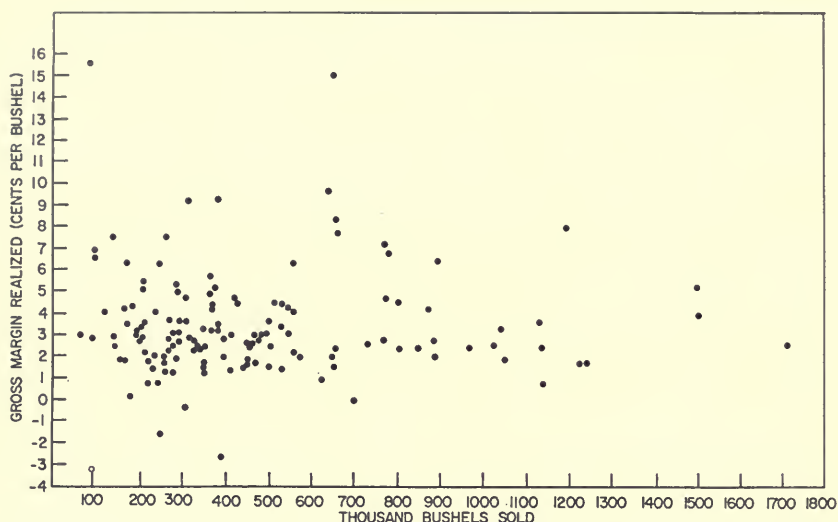
**Table 6. — Median Gross Margins Realized; Cents per Bushel;
Four Major Grains; Group Averages^a**

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Median gross margin realized; cents per bushel				
	Corn	Oats	Soybeans	Wheat	All grains
Group A: sales under 75 percent grain					
A1: volume under \$750,000 . . .	3.1	2.2	6.5	2.4	3.3
A2: volume \$750,000 to \$1,500,000	3.2	2.4	5.5	8.5	3.8
A3: volume over \$1,500,000 . . .	4.3	4.5	6.4	5.0	4.8
Group B: sales 75 to 89 percent grain					
B1: volume under \$750,000 . . .	2.0	3.0	5.7	5.4	3.5
B2: volume \$750,000 to \$1,500,000	2.4	3.1	5.3	5.1	3.3
B3: volume over \$1,500,000 . . .	3.0	3.7	6.6	5.8	4.3
Group C: sales 90 to 100 percent grain					
C1: volume under \$750,000 . . .	2.9	2.3	5.6	5.8	3.2
C2: volume \$750,000 to \$1,500,000	3.1	2.7	5.5	6.2	4.1
C3: volume over \$1,500,000 . . .	3.3	3.7	5.1	4.0	3.8
All Group A firms	3.3	3.0	6.3	5.0	3.8
All Group B firms	2.6	3.2	5.8	5.4	3.7
All Group C firms	3.0	2.6	5.5	6.1	3.7
All Group 1 firms	2.9	2.5	5.9	5.5	3.4
All Group 2 firms	2.8	2.8	5.4	5.9	3.9
All Group 3 firms	3.5	3.8	6.1	5.8	4.3
Average, all firms	2.9	2.9	5.6	5.8	3.8

^a Based on information from 138 firms for corn, 133 for oats, 135 for soybeans, and 124 for wheat.

realized, because local sales generally take place in smaller lots with higher costs that have to be covered in the handling margins. Firms that are able to sell to truckers may get higher prices than those who have to depend entirely on rail outlets. Prices paid to farmers for grain may vary depending on how much competition the elevator has. Shrinkage, or loss of grain, has an important influence on margins.

Average grain margins realized were calculated for different regions of the state. The regional demarcation (Fig. 5) used was similar to one used in other recent grain marketing studies and was based on grain production, sales, and marketing patterns. The differences among average regional margins were statistically significant (Table 7), margins being lowest in the Central and River regions, somewhat higher in the West and Southwestern regions, and highest in the North and South regions. Regional differences were probably due to the amount of competition and the importance of local sales. The Central and River



Relationship between margins for corn and sales volumes.

(Fig. 4)



Regions used in analysis of grain margins. (Fig. 5)

regions are in the heart of the cash-grain area. The number of elevators in these regions is large, presumably competition is strong, and livestock numbers are relatively low, so that local sales are relatively unimportant. The North and South regions were less important as commercial grain areas and had fewer elevators. The elevators there had less competition and their local sales were relatively more important.

The proportions of different grains handled varied among regions (Table 8). The proportion of corn and oats handled in the north was high in relation to soybeans and wheat and vice versa in the south. This consideration, as well as the difference in the per bushel margin for a given grain, helps to explain the differences in the "all grain" column in Table 7.

Table 7. — Statistical Analysis of Gross Margins Realized; Four Major Grains; Cents per Bushel; Region of State

Item	Number of elevators ^a	Average gross margins realized; cents per bushel ^b				
		Corn	Oats	Soybeans	Wheat	All grain
Region ^c						
South.....	8	7.7 (1.2)	10.9 (1.9)	11.0 (5.9)	8.2 (2.2)	8.7 (2.1)
Southwest..	22	3.6 (1.9)	5.3 (2.2)	6.7 (3.6)	6.5 (1.8)	5.0 (1.5)
Central....	65	2.5 (1.8)	2.4 (3.3)	5.4 (4.8)	5.7 (3.2)	3.4 (0.9)
River.....	24	3.0 (1.3)	2.9 (1.6)	5.9 (3.4)	4.8 (1.8)	3.3 (1.2)
West.....	9	4.8 (2.8)	5.2 (4.0)	7.0 (1.6)	7.0 (3.4)	5.8 (1.1)
North.....	10	5.6 (3.4)	5.0 (5.0)	7.9 (1.9)	6.5 (3.6)	5.9 (4.8)
Total.....	138	3.4 (2.6)	3.7 (3.8)	6.3 (4.4)	6.0 (2.9)	4.2 (2.4)
Significance level ^d	1	1	5	10	1	
Squared correlation ratio ^e.....		.29	.38	.10	.08	.36

^a For all grains. Less for some individual grains.^b Standard deviations are shown in parentheses.^c For demarcation of regions, see Figure 5.^d Significance level of the difference among the regional means, using the F-test of the hypothesis that the means were equal.^e Indicates the proportion of total variation in margins that is associated with variation among regions.Table 8. — Regional Breakdown of Grain Sales^a

Region ^b	Sales per firm, bushels	Percent of total sales				
		Corn	Oats	Soybeans	Wheat	Other ^c
South.....	1,224,490	39.8	1.3	33.9	24.4	0.6
Southwest.....	817,382	53.0	1.8	27.2	17.9	0.1
Central.....	692,782	63.4	8.4	20.3	7.9	0.0
River.....	844,064	72.5	10.5	13.3	3.6	0.1
West.....	845,360	48.5	8.1	22.7	19.9	0.8
North.....	534,842	76.3	10.1	11.1	2.4	0.1
Total.....	769,395	60.7	7.1	21.1	10.9	0.2

^a For the 138 elevators in Table 7.^b For demarcation of regions, see Figure 5.^c Barley, rye, milo.

Two other tests were made for differences in grain margins per bushel.¹ Average margins of cooperatives were compared with those for privately owned elevators, but no significant differences were found. Average margins of elevators with accounting years ending in 1961 were compared with those of elevators with accounting years ending in 1962 to determine if different marketing conditions in the two years could have caused appreciable differences in margins. Again no significant differences were found.

¹ The F-test of the hypothesis that the means were equal was used for both analyses.

Grain shrinkage. Grain shrinkage may be due to either physical loss from spillage, spoilage, moisture loss, and so on, or to human error in weighing, testing, or bookkeeping. In the 119 firms whose records indicated shrinkages, the median shrinkage was 0.7 percent for oats, 0.4 percent for corn, and 0.3 percent for soybeans and wheat (Table 9). Individual firm shrinkages varied most for oats and least for soybeans.

Gross margins realized on merchandise. Merchandise was handled by 159 of the 168 firms. Feed was the most important class of merchandise. Fifty-seven percent of the firms reported feed sales separately; they accounted for 34 percent of total merchandise sales (Table 10). Coal, seed, and fertilizer were other classes reported separately by a large number of firms, although of the three, only fertilizer accounted for a sizable part of total merchandise sales, 16 percent. Petroleum products, although reported separately by only 11 percent of the firms, accounted for 12 percent of total merchandise sales. Analysis of merchandise sales is complicated by the fact that 17 firms, most of them in Group C, did not separate even the major merchandise sub-classes.

Median gross margins realized for the major types of merchandise ranged from a low of 11.5 percent for fertilizer to a high of 21.1 percent for coal (Table 11). The median for all merchandise was 14.8

Table 9. — Percent of Grain Shrinkage or Overrun; Four Types of Grain*

Shrinkage or overrun as percent of sales	Corn	Oats	Soybeans	Wheat
<i>perct. of firms</i>				
Shrinkage (—)				
4.0 and over.....	4.2	9.2	1.7	.9
3.0 to 3.9.....	3.4	7.6	....	....
2.0 to 2.9.....	8.4	9.2	4.2	3.8
1.0 to 1.9.....	16.8	20.2	12.7	12.3
.5 to .9.....	14.3	10.1	22.0	19.8
.1 to .4.....	33.6	16.8	24.6	32.1
Total.....	80.7	73.1	65.2	68.9
No shrinkage or overrun.....	4.2	3.4	11.9	15.1
Overrun (+)				
.1 to .4.....	8.4	4.2	10.2	14.2
.5 to .9.....	3.4	6.7	6.8	....
1.0 to 1.9.....	2.5	5.9	4.3	.9
2.0 to 2.9.....	....	1.7	0.8	.9
3.0 to 3.9.....	.8	....	0.8	....
4.0 and over.....	....	5.0	....	....
Total.....	15.1	23.5	22.9	16.0
Average.....	— .9	— .9	— .5	— .4
Median.....	— .4	— .7	— .3	— .3

* Based on information from 119 firms for corn and oats, 118 firms for soybeans, and 106 firms for wheat.

Table 10. — Importance of Various Types of Merchandise Sales

Type of merchandise	Percent of firms reporting sales separately ^a	Average sales of firms reporting separately ^a	Percent of total merchandise sales
Feed.....	57	\$129,155	34
Fertilizer.....	44	75,673	16
Seed and inoculants.....	45	19,988	4
Coal.....	49	18,386	4
Petroleum products.....	11	224,480	12
Lumber and building materials.....	14	84,828	6
Fencing and posts.....	10	4,787	^b
Other and unspecified ^c.....	..	.....	24
All merchandise.....	95	\$224,758	100

^a Firms that entered sales of specific items separately in their accounts; other firms probably sold the items but did not enter them separately.

^b Less than .5 percent.

^c Includes hardware, machinery, equipment, chemicals, twine, poultry, and other miscellaneous merchandise, and merchandise that was not specified by type.

Table 11. — Gross Margins Realized; Each Type of Merchandise^a

Gross margin realized as percent of sales	Feed	Fertilizer	Seed and inoculant	Coal	Petroleum products	Lumber and building materials	Fencing and posts	All merchandise
				<i>perct. of firms</i>				
Loss.....	..	3	2	2	11	..	6	1
0-4.9.....	2	12	4	1	5	..	6	3
5-9.9.....	13	23	23	2	5	5	6	11
10-14.9.....	51	38	31	19	21	23	12	36
15-19.9.....	34	16	20	19	21	36	41	39
20-24.9.....	..	7	12	30	21	18	17	6
25 and over..	..	1	8	27	16	18	12	4
Average margin....	13.5	11.3	13.8	22.0	15.2	22.0	15.0	14.7
Median margin....	13.6	11.5	13.4	21.1	15.7	19.1	17.4	14.8

^a Based on information from 94 firms for feed, 74 for fertilizer, 75 for seed, 81 for coal, 19 for petroleum, 22 for lumber, 17 for fencing and posts, and 158 for all merchandise.

percent. Margins were most uniform for feed (between 10 and 15 percent in 51 percent of the firms) and least uniform for petroleum products.

Merchandise margins were highest in the group with the highest percent of merchandise sales to total sales, Group A (Table 12). Judging by group averages, merchandise margins did not vary in any consistent manner as the size of the firms varied. Lack of relationship between margins and sales volume also held true for individual mer-

Table 12. — Average Gross Margins Realized; Feed, Fertilizer, Seed, Coal, and All Merchandise; Group Averages^a

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Average gross margins realized as percent of sales				
	Feed	Fertilizer	Seed	Coal	All merchandise
Group A: sales under 75 percent grain					
A1: volume under \$750,000.....	15.4	9.1	14.1	28.3	17.4
A2: volume \$750,000 to \$1,500,000	14.9	17.9	20.7	21.8	16.7
A3: volume over \$1,500,000.....	14.7	13.7	17.0	24.0	16.4
Group B: sales 75 to 89 percent grain					
B1: volume under \$750,000.....	13.7	10.2	5.4	17.2	15.3
B2: volume \$750,000 to \$1,500,000	13.1	9.7	13.2	18.5	14.8
B3: volume over \$1,500,000.....	13.5	11.2	14.6	22.6	15.0
Group C: sales 90 to 100 percent grain					
C1: volume under \$750,000.....	10.3	9.2	11.3	17.5	11.1
C2: volume \$750,000 to \$1,500,000	11.8	11.2	11.4	32.5	13.4
C3: volume over \$1,500,000.....	13.6	12.6	17.7	17.1	13.7
All Group A firms.....	15.1	13.0	17.1	24.9	17.2
All Group B firms.....	13.4	10.4	11.8	19.2	15.0
All Group C firms.....	11.8	10.9	14.2	23.3	12.9
All Group 1 firms.....	13.7	9.4	10.2	21.5	14.7
All Group 2 firms.....	13.1	11.8	14.6	23.2	14.8
All Group 3 firms.....	13.9	12.2	16.1	20.6	14.9
Average, all firms.....	13.5	11.3	13.8	22.0	14.7

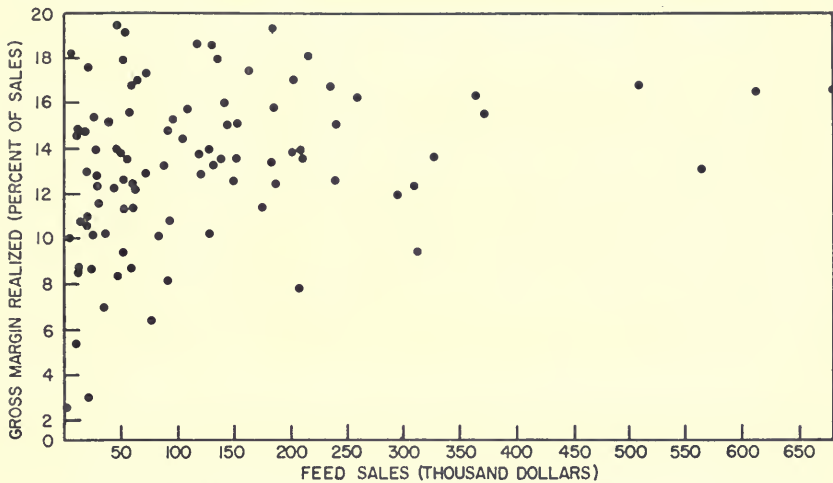
^a Based on information from 94 firms for feed, 74 for fertilizer, 75 for seed, 81 for coal and 158 for all merchandise.

chandise classes. For example, feed margins averaged about the same at all sales volumes, with wide variations about the average at each level, although they became more uniform at the larger volumes (Fig. 6). Although not shown, the lack of relationship between margins and volumes was also true for fertilizer, seed, coal, and all merchandise.

Average merchandise margins were calculated by regions for feed, fertilizer, seed, and coal, using the same regional demarcation that was used in the analysis of grain margins (Fig. 5). Average feed margins as percents of feed sales for the regions were: Central, 12.4; Southwest, 12.8; River, 13.1; West, 13.5; North, 14.8; and South, 16.0. This pattern was similar to that noted for grain margins, although the spread was not as great and the difference among feed margins was significant at only the 10-percent level.¹ Average margins for fertilizer, seed, and coal did not differ significantly among regions.²

¹ Significance level based on the F-test of the hypothesis that the means were equal. The squared correlation ratio, indicating the proportion of the total variation in margins associated with variations among regions, was 0.11.

² Based on F-tests of the hypotheses that the means were equal.



Relationship between margins for feed and sales volumes.

(Fig. 6)

Merchandise inventory turnover

Inventory turnover has an important effect on the profitability of handling merchandise. With a high turnover, the cost of fixed resources allocated to the merchandise enterprise can be spread over more items; it is also quite likely that variable cost resources can be more efficiently used.

Annual inventory turnovers were calculated for elevators in the study, where the information was available, by dividing the cost of sales by the average of the beginning and ending inventory. Elevators with similar actual turnovers, however, could appear to have different turnovers because their accounting years ended at different phases of the sale of a seasonal item, or because their accounting year-end inventories were not typical of their usual inventories. For these reasons, the figures are not very reliable. The average inventory turnovers calculated were: feed, 15.3; fertilizer, 22.9; seed, 18.6; coal, 13.8; petroleum products, 12.5; lumber and building materials, 2.2; and fencing and posts, 1.2.

Service incomes

All but five of the 168 firms earned some type of service income. A breakdown of service income indicates that storage and handling of grain for CCC were the chief items, being reported separately by 86

Table 13. — Importance of Various Types of Service Income

Type of service	Percent of firms re- porting sales separately	Average sales of firms reporting separately	Percent of total service income
Storage and handling, CCC.....	86	\$26,286	59
Storage, farmers.....	55	7,494	11
Grinding and mixing.....	46	11,549	14
Trucking.....	29	4,866	3
Drying.....	25	6,266	4
Other and unspecified.....	..	.....	9
All services.....	97	\$39,561	100

^a Includes shelling, cleaning, grain bank, weighing, spreading, commissions, equipment rental, and miscellaneous income and service income that was not specified by type.

percent of the firms and accounting for 59 percent of total service income (Table 13). Other important items were storage of grain for farmers, grinding and mixing, trucking, and drying.

The importance of various types of service income varied considerably among elevator groups (Table 14). Overall, income from CCC storage and handling accounted for about one-fifth of total gross operating incomes (Table 15). In one elevator group, C1, however, it represented 52 percent of total gross operating income, and in another group, B1, it represented 38 percent.

Grain banks

About one-third of the elevators conducted grain bank operations in which customers were allowed to deposit grain against future withdrawals of complete feeds. Only 11 elevators, however, listed the grain bank as a separate source of service income. Others included it in other service income accounts such as grinding, storage, or handling, or included it in the grain trading income. Nine elevators reported no charge at all for the grain bank service. Different methods of accounting for this income occur chiefly because the Illinois Commerce Commission, which regulates warehouses, has stated that unlicensed warehouses and elevators are not permitted by Illinois law to store grain or operate grain banks on a bushel basis.

Operating expenses

Operating expenses varied widely among elevator groups. They were as low as \$29,337 in Group C1 and as high as \$213,887 in Group A3 (Table 16). For individual elevators, they varied from a low of

Table 14. — Service Income; Group Averages

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Type of service income						
	Storage and handling, CCC	Storage, farmers	Grinding and mixing	Trucking	Drying	Other and unspecified	Total
Group A: sales under 75 percent grain							
A1: volume under \$750,000.....	\$ 8,783	\$3,465	\$8,077	\$1,491	\$ 284	\$1,304	\$23,404
A2: volume \$750,000 to \$1,500,000.....	9,882	295	6,106	578	3,368	3,709	23,938
A3: volume over \$1,500,000.....	12,562	2,140	12,016	5,287	354	11,496	43,855
Group B: sales 75 to 89 percent grain							
B1: volume under \$750,000.....	18,383	1,231	3,605	1,113	633	817	25,782
B2: volume \$750,000 to \$1,500,000.....	21,842	5,171	4,994	960	803	3,072	36,842
B3: volume over \$1,500,000.....	47,065	11,365	14,706	5,199	5,133	7,269	90,737
Group C: sales 90 to 100 percent grain							
C1: volume under \$750,000.....	19,525	1,397	384	206	329	295	22,136
C2: volume \$750,000 to \$1,500,000.....	21,384	3,885	1,379	1,198	2,282	1,769	31,867
C3: volume over \$1,500,000.....	34,795	5,661	2,799	.....	947	3,171	47,373
All Group A firms.....	10,124	2,230	8,618	1,491	1,152	5,560	29,175
All Group B firms.....	29,144	6,231	7,792	2,362	2,157	3,888	51,574
All Group C firms.....	24,068	3,480	1,397	573	1,302	1,624	32,444
All Group 1 firms.....	15,719	2,032	3,721	857	392	758	23,479
All Group 2 firms.....	19,648	3,780	3,591	1,001	1,880	2,605	32,505
All Group 3 firms.....	34,551	7,143	9,770	2,664	2,500	7,452	64,080
Average, all firms.....	\$22,531	\$4,149	\$5,362	\$1,419	\$1,566	\$3,357	\$38,384

Table 15.—CCC Storage and Handling Income as Percent of Gross Operating Income; Group Averages

Firms classified by percent that grain was of total sales (grain and merchandise)	Firms classified by volume (total sales plus service income)			Average
	All Group 1 firms; volume under \$750,000	All Group 2 firms; volume \$750,000 to \$1,500,000	All Group 3 firms; volume over \$1,500,000	
CCC income as percent of gross operating income ^a				
All Group A firms.....	13	8	4	7
All Group B firms.....	38	23	21	23
All Group C firms.....	52	31	27	33
Average, all firms.....	31	22	17	21

^a Group average percents calculated from group dollar averages.

\$16,000 to a high of \$525,000 (Fig. 7). Although operating expenses tended to increase as total sales plus service income increased, there was a wide range of operating expense figures for any given level of total sales plus service income. At any given level of total sales plus service income, Group A firms tended to have the largest expenses and Group C the smallest, but there were wide spreads within groups.

To determine the effect of size on operating expenses, considering grain sales, merchandise sales, and service income as separate variables, a multiple regression analysis was made.¹

The analysis indicates that the starting point was \$1,031 with no sales or service income. This point is logically equal to fixed expenses, although in actuality, different elevators would have different fixed expenses. The analysis also indicated that operating expenses increased 2.8 cents for every \$1.00 increase in grain sales, 14.3 cents for every \$1.00 increase in merchandise sales, and 62.6 cents for every \$1.00 increase in service income.

These figures appear logical when compared with the results of the

¹ The multiple regression analysis gave the following result:

$$X_1 = 1.031 + .02785X_2 + .14339X_3 + .62585X_4$$

(0.00495) (.01063) (.10459)

$$R = .85632$$

$$S = 40.431$$

Where: X_1 = operating expenses (in thousands of dollars)

X_2 = grain sales (in thousands of dollars)

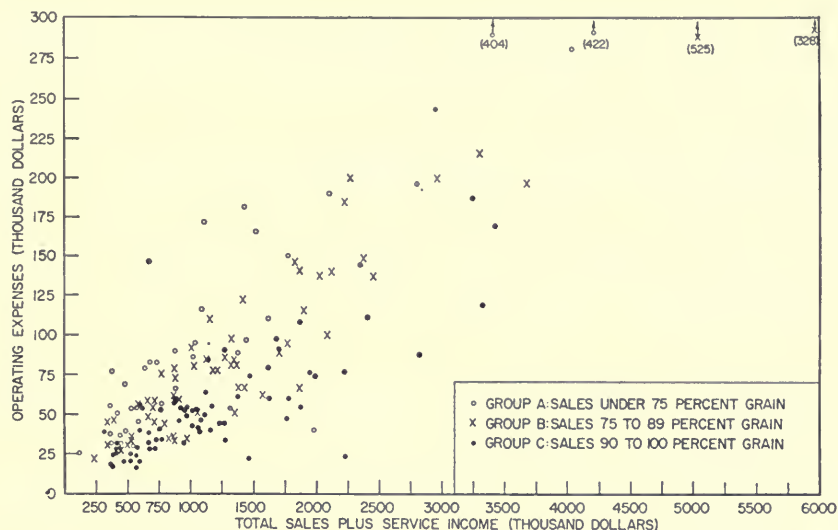
X_3 = merchandise sales (in thousands of dollars)

X_4 = service income (in thousands of dollars)

R = coefficient of multiple correlation

S = standard error of estimate for the equation (in thousands of dollars)

Standard errors of the regression coefficients are shown in parentheses. All the coefficients were significant at the one-percent level.



Relationship between operating expenses and business volume (total sales plus service income). (Fig. 7)

analysis of net operating income (pp. 6-13) and with the gross margins indicated (pp. 13-20). The 2.8 cents of expense per \$1.00 of grain sales added to the 0.8 cent of net operating income per \$1.00 of grain sales equals 3.6 cents, just 0.2 cent less than the 3.8 cents median gross margin realized for all grain (Table 6). The 14.3 cents of expense per \$1.00 of merchandise sales added to the 5.3 cents of net operating income per \$1.00 of merchandise sales equals 19.6 cents or 4.8 cents more than the median margin of 14.8 cents realized for all merchandise (Table 11). The 62.6 cents of expense per \$1.00 of service income added to the 37.9 cents of net operating income per \$1.00 of service income equals \$1.005. Since service income does not have any cost of sales to be deducted, this is only 0.5 cent more than the \$1.00 it should equal.

These similarities make the equation appear quite logical, even though it explained only about 73 percent of the variation in operating expenses and the standard error, which is a measure of reliability, was a rather large \$40,431.

The linear multiple regression analysis used was not entirely realistic, because expenses cannot be expected to change in constant proportion to changes in business volume. As volume grows larger, fixed storage and handling facility costs per unit of volume grow smaller. More specialization of labor and equipment is also possible as business

Table 16. — Summary of Operating Expenses; Elevators Classified by Volume (Total Sales Plus Service Income) and by Percent of Total Sales (Grain and Merchandise) That Was Grain; Group Averages

Item	Group A: sales under 75 percent grain			Group B: sales 75 to 89 percent grain			Group C: sales 90 to 100 percent grain		
	Group A1	Group A2	Group A3	Group B1	Group B2	Group B3	Group C1	Group C2	Group C3
	firms; volume under \$750,000 \$1,500,000	firms; volume under \$750,000 \$1,500,000	firms; volume over \$1,500,000	firms; volume under \$750,000	firms; volume over \$750,000 \$1,500,000	firms; volume over \$1,500,000	firms; volume under \$750,000	firms; volume over \$750,000 \$1,500,000	firms; volume over \$1,500,000
Management and labor									
Salaries and wages.....	\$27,911	\$51,846	\$120,133	\$17,787	\$32,468	\$80,304	\$13,120	\$21,365	\$42,982
Service fees ^a	739	982	2,694	571	975	2,088	324	687	818
Directors' fees.....	266	1,188	920	215	349	523	84	328	360
Other ^b	1,116	2,029	7,237	610	1,150	3,672	359	616	1,397
Subtotal.....	30,032	56,045	130,984	19,183	34,942	86,587	13,887	22,996	45,557
Physical plant									
Power, light, fuel, and water	2,410	3,253	5,474	1,461	2,428	6,756	1,042	2,135	3,049
Elevator repairs, and sup- plies.....	2,675	4,942	6,128	1,865	3,664	8,168	1,748	3,383	4,427
Truck and hauling.....	2,115	6,146	18,338	2,584	3,998	9,795	1,078	1,684	2,021
Depreciation and amorti- zation.....	7,079	11,405	23,250	8,015	11,290	28,479	6,047	10,602	13,707
Insurance and bonding....	2,697	4,192	5,661	2,195	3,134	7,324	1,772	2,641	4,113
Property taxes.....	2,509	2,824	6,140	1,783	3,117	6,860	1,340	2,468	4,225
Rent.....	1,152	443	1,578	113	353	2,374	159	136	2,016
Other ^c	1,601	1,637	1,099	649	942	2,144	320	1,430	2,331
Subtotal.....	22,238	34,842	67,668	18,665	28,926	71,900	13,506	24,479	35,889
Office and records									
Office supplies.....	624	1,021	2,728	461	931	2,544	358	580	1,559
Telephone and telegraph..	471	916	1,755	452	509	1,512	295	591	792
Advertising.....	1,245	2,839	3,652	601	1,177	2,211	297	583	1,105
Bad debt.....	373	635	1,462	460	1,270	2,129	89	385	765
Bank expense.....	7	47	62	12	132	84	132	23	1,034
Subtotal.....	2,720	5,458	9,659	1,986	4,019	8,480	1,171	2,162	5,255
General									
Dues, donations, and sub- scriptions.....	271	528	601	208	295	580	120	202	330
Travel expense ^d	362	590	1,158	189	330	1,025	96	126	428
Annual meeting.....	143	405	1,827	64	193	562	9	160	281
Sales and franchise tax....	777	1,702	1,566	551	1,434	1,084	213	341	520
Other ^e	712	706	424	936	639	503	335	316	1,533
Subtotal.....	2,265	3,931	5,576	1,948	2,891	3,754	773	1,145	3,092
Total operating expense.....	\$57,255	\$100,276	\$213,887	\$41,782	\$70,778	\$170,722	\$29,337	\$50,782	\$89,793

Table 16. — Concluded

	All Group A firms	All Group B firms	All Group C firms	All Group 1 firms	All Group 2 firms	All Group 3 firms	Average, all groups
Management and labor							
Salaries and wages.....	\$59,856	\$44,390	\$23,943	\$19,149	\$30,818	\$76,127	\$39,673
Service fees ^a	1,343	1,238	598	522	850	1,771	1,000
Directors' fees.....	699	373	254	177	480	557	402
Other ^b	3,050	1,834	722	671	1,062	3,083	1,667
Subtotal.....	64,948	47,835	25,517	20,519	33,210	82,138	42,743
Physical plant							
Power, light, fuel and water.....	3,484	3,592	1,996	1,596	2,437	5,115	2,911
Elevator repairs and supplies.....	4,248	4,688	3,095	2,081	3,754	6,337	3,929
Truck and hauling.....	7,685	5,529	1,565	1,800	3,339	8,983	4,414
Depreciation and amortization.....	12,716	16,048	9,848	6,887	11,005	21,912	12,708
Insurance and bonding.....	3,923	4,261	2,714	2,183	3,094	5,774	3,545
Property taxes.....	3,594	4,006	2,525	1,835	2,783	5,738	3,300
Rent.....	1,074	947	607	472	273	2,058	838
Other ^c	1,473	1,259	1,283	823	1,273	1,967	1,320
Subtotal.....	38,197	40,330	23,633	17,677	27,958	57,884	32,965
Office and records							
Office supplies.....	1,312	1,339	748	471	792	2,231	1,089
Telephone and telegraph.....	946	818	542	392	613	1,309	735
Advertising.....	2,345	1,374	616	684	1,193	2,148	1,294
Bad debt.....	745	1,354	380	277	775	1,479	809
Bank expense.....	33	88	308	61	70	422	166
Subtotal.....	5,381	4,973	2,594	1,885	3,443	7,589	4,093
General							
Dues, donations, and subscriptions.....	432	366	206	192	293	495	316
Travel expense ^d	644	520	191	207	284	840	414
Annual meeting.....	678	281	140	67	214	756	318
Sales and franchise tax.....	1,249	1,113	342	484	999	993	829
Other ^e	631	665	622	611	507	857	639
Subtotal.....	3,634	2,945	1,501	1,561	2,297	3,941	2,516
Total operating expense.....	\$112,160	\$96,083	\$53,245	\$41,642	\$66,908	\$151,552	\$82,317

^a Fees paid for services such as audit, legal, and collection, sales commissions, etc.^b Chiefly employment taxes and group insurance.^c Includes undistributed plant expenses such as drying, storage, handling, shrinkage, cleaning, shelling and CCC expenses, and miscellaneous plant expenses such as fumigation and pest control, scale tests, laboratory tests, inspection fees, etc.^d Includes travel and entertainment expense.^e Miscellaneous expenses.

volume grows larger, reducing the cost per unit of volume of these items. To try to partially account for this, separate analyses were made for each of the three size groups. The resulting equations were not logical in form, however, and did not reveal whether there were economies of scale.

Operating expense as a percent of total sales plus service income was compared for the different groups of firms. The group averages indicate that as between small and medium firms the percentage was sharply lower in the medium firms (Table 17), but as between medium and large firms, it was only slightly lower in the large firms. Two main categories of operating expense were physical plant expense and management and labor expense. They too were calculated as percentages of total sales plus service income and compared among groups. In both categories, the percentage dropped sharply between small and medium

**Table 17.—Major Operating Expense Categories as Percent of Volume^a
(Total Sales Plus Service Income); Group Averages**

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Manage- ment and labor	Physical plant	Office and records	General	Total operating expenses
Group A: sales under 75 percent grain		<i>perct. of volume</i>			
A1: volume under \$750,000....	6.2	4.6	0.6	0.5	11.9
A2: volume \$750,000 to \$1,500,000.....	5.1	3.1	0.5	0.3	9.0
A3: volume over \$1,500,000...	4.8	2.5	0.4	0.1	7.8
Group B: sales 75 to 89 percent grain					
B1: volume under \$750,000...	3.9	3.5	0.4	0.4	8.2
B2: volume \$750,000 to \$1,500,000.....	3.3	2.6	0.3	0.3	6.5
B3: volume over \$1,500,000...	3.2	2.8	0.3	0.1	6.4
Group C: sales 90 to 100 percent grain					
C1: volume under \$750,000...	2.7	2.5	0.2	0.1	5.5
C2: volume \$750,000 to \$1,500,000.....	2.2	2.3	0.2	0.1	4.8
C3: volume over \$1,500,000...	2.2	1.6	0.2	0.1	4.1
All Group A firms.....	5.5	3.6	0.5	0.4	10.0
All Group B firms.....	3.4	2.9	0.3	0.3	6.9
All Group C firms.....	2.4	2.2	0.2	0.1	4.9
All Group 1 firms.....	4.2	3.5	0.4	0.3	8.4
All Group 2 firms.....	3.1	2.6	0.3	0.2	6.2
All Group 3 firms.....	3.2	2.3	0.3	0.1	5.9
Average, all firms.....	3.5	2.8	0.4	0.2	6.9

^a Group averages calculated from individual firm percentages.

firms. The physical plant expense percentage dropped only moderately between medium and large firms.¹

Adequate discussion of expenses is complicated by the fact that some of the businesses were single-plant firms and some were multi-plant firms. Two plants of medium size in different locations could not logically be expected to have expenses identical to those of one large plant equal in size to the total of the two medium plants. In this study, these differences were not measured because of the great variety in number and type of plants per firm.

Managers' salaries

Managers' salaries ranged from \$4,300 to \$15,000, the average being \$7,081. It appears from the group averages that managers' salaries increased with increasing size of business, but did not change in any particular pattern as the percent of merchandise to total sales changed (Table 18).

Table 18. — Average Salaries Paid Elevator Managers; Group Averages*

Firms classified by percent that grain was of total sales (grain and merchandise)	Firms classified by volume (total sales plus service income)			Average
	All Group 1 firms; volume under \$750,000	All Group 2 firms; volume \$750,000 to \$1,500,000	All Group 3 firms; volume over \$1,500,000	
All Group A firms.....	\$6,402	\$7,501	\$9,267	\$7,242
All Group B firms.....	5,328	6,085	9,824	7,231
All Group C firms.....	5,657	6,798	7,896	6,877
Average, all firms.....	\$5,802	\$6,651	\$8,868	\$7,081

* Based on salaries reported by 114 elevators.

In addition to the managers' salaries, at least 23 elevators paid bonuses.² The bonuses (not included in Table 18) added an average of 23 percent to the managers' salaries. Before the bonuses were paid, the salaries of the managers who received bonuses were about 3 percent above the average.

¹ This figure decreased slightly in two subgroups and was constant in the other, but due to the peculiarities of averaging, it showed an increase in the total for the large group.

² Other firms may also have paid bonuses. The question was not specifically asked and a notation was made only if the bonus appeared separately on the elevator's records. Bonuses were included as part of management and labor expenses.

Table 19. — Balance Sheet, Summary; Group Averages^a

Group A: sales under 75 percent grain				Group B: sales 75 to 89 percent grain		Group C: sales 90 to 100 percent grain			
Item	Group A1 firms; volume under \$750,000	Group A2 firms; volume over \$750,000 to \$1,500,000	Group A3 firms; volume over \$1,500,000	Group B1 firms; volume under \$750,000	Group B2 firms; volume over \$750,000 to \$1,500,000	Group B3 firms; volume over \$1,500,000	Group C1 firms; volume under \$750,000	Group C2 firms; volume over \$750,000 to \$1,500,000	Group C3 firms; volume over \$1,500,000
Assets									
Current assets									
Cash ^b	\$15,299	\$32,293	\$118,263	\$ 7,860	\$22,313	\$42,633	\$17,881	\$35,763	\$51,684
Accounts receivable, patrons....	33,785	60,894	86,827	19,468	44,849	84,093	8,417	16,907	32,619
Other accounts receivable.....	3,946	5,982	23,219	4,629	7,822	16,144	5,685	11,488	16,824
Notes receivable.....	691	5,841	6,771	1,584	4,292	6,363	882	297	1,788
Prepaid expenses.....	1,237	1,956	6,115	993	1,496	4,120	732	1,901	1,599
Accrued income ^d	14	14	18	50	116	404	404	404	404
Grain inventory.....	8,826	20,575	149,169	11,287	33,290	93,760	15,556	32,738	114,185
Merchandise inventory.....	29,986	61,995	100,589	19,472	27,651	67,144	7,010	12,954	8,305
Total current assets.....	93,784	189,550	490,971	65,343	141,829	314,257	56,163	112,452	227,004
Fixed assets, net.....	73,515	109,999	204,199	76,699	127,673	335,689	69,926	119,128	178,686
Investments.....	788	18,542	113,064	3,097	4,100	35,326	2,154	7,827	28,094
Other assets ^e	2,159	1,798	1,798	8	11	1,130	1,026	1,026	855
Total assets.....	170,246	318,091	810,032	145,147	273,613	686,402	129,269	239,407	434,639
Liabilities									
Current liabilities									
Accounts payable, patrons.....	10,674	17,778	43,124	7,833	18,822	40,909	9,851	16,235	33,876
Other accounts payable.....	4,212	15,184	142,871	4,011	19,077	38,527	8,642	14,105	55,029
Notes payable ^f	15,379	19,946	23,190	19,405	21,264	76,141	7,757	19,867	19,250
Patronage refunds payable.....	1,039	11,163	45,530	1,840	5,620	11,437	1,162	3,325	10,824
Stock dividends payable.....	929	2,843	10,702	391	1,190	5,269	195	1,078	1,419
Deferred income ^g	26	.....	.....	672	93	652	18	183	976
Accrued expenses ^h	5,266	13,157	35,413	4,640	5,959	18,779	3,456	4,989	10,952
Total current liabilities.....	37,525	80,071	300,830	38,792	72,025	191,714	31,081	59,782	132,326
Noncurrent liabilities.....	16,248	13,624	64,752	16,750	27,139	109,737	19,855	20,753	35,318
Total liabilities.....	53,773	93,695	365,582	55,542	99,164	301,451	50,936	80,535	167,644
Net worth									
Capital stock.....	23,718	86,457	256,545	41,674	46,790	198,656	20,365	67,313	118,899
Surplus.....	92,755	137,939	187,905	47,931	127,659	186,295	57,968	91,559	148,096
Total net worth.....	116,473	224,396	444,450	89,605	174,449	384,951	78,333	158,872	266,995
Total liabilities plus net worth.....	\$170,246	\$318,091	\$810,032	\$145,147	\$273,613	\$686,402	\$129,269	\$239,407	\$434,639

Table 19. — Concluded

Item	All Group A firms	All Group B firms	All Group C firms	All Group 1 firms	All Group 2 firms	All Group 3 firms	Average, all groups
Assets							
Current assets							
Cash ^a	\$ 49,133	\$ 25,427	\$34,198	\$14,339	\$ 29,886	\$ 63,607	\$ 34,592
Accounts receivable, patrons.....	56,392	51,465	18,233	19,686	35,246	66,116	39,135
Other accounts receivable.....	9,956	9,744	11,023	4,832	9,126	18,046	10,314
Notes receivable.....	3,858	4,316	859	1,009	2,795	4,803	2,054
Prepaid expenses ^b	2,816	2,222	1,458	968	1,750	3,675	2,802
Accrued income ^d	15	63	175	18	226	4	97
Grain inventory.....	51,724	47,542	48,017	12,206	30,928	114,116	48,723
Merchandise inventory.....	58,928	38,428	9,911	17,876	26,917	53,689	31,694
Total current assets.....	232,822	179,207	123,874	70,934	136,874	324,056	169,411
Fixed assets, net.....	120,665	182,566	118,818	72,922	120,972	248,127	142,049
Investments.....	37,448	13,918	11,191	1,962	8,145	50,904	18,376
Other assets ^e	1,448	370	539	1,123	4	1,187	694
Total assets.....	392,398	376,061	254,422	146,940	265,995	624,274	330,530
Liabilities							
Current liabilities							
Accounts payable, patrons.....	21,830	23,328	18,710	9,577	17,512	38,883	21,099
Other accounts payable.....	46,416	21,764	22,776	5,947	16,243	68,917	28,001
Notes payable ^f	18,871	38,497	15,914	13,385	20,429	43,171	24,688
Patronage refunds payable.....	16,443	6,596	4,550	1,304	5,536	19,194	8,093
Stock dividends payable.....	4,225	2,314	888	488	1,416	5,148	2,187
Deferred income ^g	11	410	333	197	117	617	284
Accrued expenses ^h	15,995	9,774	6,021	4,366	6,733	19,841	9,721
Total current liabilities.....	123,791	102,683	69,192	35,264	67,986	195,771	94,073
Noncurrent liabilities.....	29,188	51,273	24,167	17,840	22,081	72,291	35,046
Total liabilities.....	152,979	153,956	93,359	53,104	90,067	268,062	129,119
Net worth							
Capital stock.....	107,083	94,482	65,687	27,198	62,419	183,357	85,768
Surplus.....	132,336	127,623	95,376	66,638	113,509	172,855	115,643
Total net worth.....	239,419	222,105	161,063	93,836	175,928	356,212	201,411
Total liabilities plus net worth.....	\$392,398	\$376,061	\$254,422	\$146,940	\$265,995	\$624,274	\$330,530

^a Three firms, one in Group A1 and two in Group C1, did not have balance sheets and were not included in the averages.

^b Includes cash and marketable securities.

^c Includes prepaid insurance, rent, supplies, etc.

^d Chiefly accrued interest.

^e Includes goodwill, trademarks, permits, sales territories, cash value of life insurance, organization expenses, etc.

^f Includes notes, mortgages and contracts payable, and bank overdrafts.

^g Chiefly deferred storage income.

^h Includes accrued taxes, interest and salaries reserves, checks outstanding, etc.

At least 22 elevators provided houses for their managers.¹ Not counting the value of the use of the house, the salaries of these managers were about 5 percent below the average.²

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Assets of the average elevator were \$330,530, of which \$129,119 was liabilities and \$201,411 was net worth (Table 19). Judging by group averages, total assets increased with increasing size of business and with an increasing percent of merchandise to total sales. Large assets in firms with greater proportions of merchandise were due primarily to larger accounts receivable and to larger merchandise inventories.

Balance sheet information can often be evaluated most meaningfully when it is expressed in ratios. Ratios make it easy to compare the same item over a period of time and they make comparisons among firms possible. In some cases, generally accepted standards for comparison are available.

The current ratio (current assets divided by current liabilities) is widely used as a measure of liquidity and ability to meet debts. A ratio of 2:1 is often considered to be the minimum standard. The average current ratio of the firms in this study was 2.7:1. Current ratios for about half the firms, however, were below the 2:1 minimum standard (Table 20). These latter firms may not be in as unsatisfactory position as it at first appears, because their current assets, in considerable part, were highly liquid items such as cash and grain inventories. It does appear, however, that insufficient liquidity may be a problem with some firms. Current ratios did not vary consistently among groups, but there was a slight tendency for ratios to be higher in small firms and in firms with the largest percentages of merchandise to total sales plus service income. Merchandise inventories are generally less liquid than grain inventories, a fact that may account for the higher current ratios in firms having large percentages of merchandise to total sales plus service income.

Because accounts receivable are often among the least liquid elements of current assets, it is useful to note their relative importance. On the average, they represented about one-third of current assets. The proportion was generally highest in the smaller firms and in the firms with the largest percentages of merchandise to total sales plus

¹ Most, but not all firms, were asked about housing.

² The expenses of furnishing the houses were not separated, and so they appear as part of physical plant expenses rather than as part of management and labor expenses.

Table 20.—Current Ratios (Current Assets Divided by Current Liabilities); Group Averages

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Average ^a	Current ratio			
		Under 1.5	1.5 to 1.9	2.0 to 2.9	3.0 and over
Group A: sales under 75 percent grain		<i>perct. of firms</i>			
A1: volume under \$750,000.....	3.4	23	18	23	36
A2: volume \$750,000 to \$1,500,000.....	3.1	9	27	27	37
A3: volume over \$1,500,000.....	2.7	9	36	36	19
Group B: sales 75 to 89 percent grain					
B1: volume under \$750,000.....	2.3	50	7	29	14
B2: volume \$750,000 to \$1,500,000.....	2.3 ^b	19	27	31	23
B3: volume over \$1,500,000.....	2.0	26	37	21	16
Group C: sales 90 to 100 percent grain					
C1: volume under \$750,000.....	2.6	57	..	10	33
C2: volume \$750,000 to \$1,500,000.....	3.2 ^a	38	21	17	24
C3: volume over \$1,500,000.....	2.9	24	29	24	23
All Group A firms.....	3.1	15	26	28	31
All Group B firms.....	2.2 ^b	29	25	27	19
All Group C firms.....	2.9 ^a	40	17	17	26
All Group 1 firms.....	2.8	44	8	19	29
All Group 2 firms.....	2.8 ^{b, c}	26	24	24	26
All Group 3 firms.....	2.5	21	34	26	19
Average, all firms.....	2.7 ^{b, c}	30	22	23	25

^a Averages of individual firm ratios.^b Two firms in this group were not included in the averages because they had exceptionally large current ratios (1025.5 and 67.4).^c One firm in this group was not included in the average, because it had an exceptionally large current ratio (782.0).

service income (Table 21). According to a recent study,¹ accounts receivable should be below 40 percent of current assets. Thirty-six percent of the firms in this study did not meet that standard.

To apply an arbitrary standard to the ratio of accounts receivable to current assets is difficult. When accounts receivable are evaluated, their age must be considered. For example, the 68 percent of accounts receivable under three months old are fairly liquid assets, while the 8 percent over a year old are not only not liquid, some may even be doubtful as assets (Table 22). The proportion of old accounts in small firms was generally higher than that in large firms. Age of accounts did not seem to vary as the percentage of grain to total sales varied.

Net assets equal total assets minus current liabilities. Or, stated another way, net assets equal working capital (current assets minus current liabilities) plus fixed assets and other assets (investments, and

¹ Briscoe, Nellis A. et al. A Business Study of Single-Unit Cooperative Grain Elevators. Bul. B-562. Okla. Agr. Exp. Sta. August, 1960, p. 17.

Table 21. — Accounts Receivable as a Percent of Current Assets; Group Averages

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Aver- age ^a	Accounts receivable as percent of current assets				
		under 20	20 to 29	30 to 39	40 to 49	50 and over
Group A: sales under 75 percent grain		<i>perct. of firms</i>				
A1: volume under \$750,000.....	41	..	18	29	29	24
A2: volume \$750,000 to \$1,500,000.....	38	18	18	27	9	28
A3: volume over \$1,500,000.....	31	18	18	37	27	..
Group B: sales 75 to 89 percent grain						
B1: volume under \$750,000.....	37	14	36	..	21	29
B2: volume \$750,000 to \$1,500,000.....	37	12	15	19	42	12
B3: volume over \$1,500,000.....	34	21	21	32	16	10
Group C: sales 90 to 100 percent grain						
C1: volume under \$750,000.....	32	24	29	14	14	19
C2: volume \$750,000 to \$1,500,000.....	28	38	21	14	17	10
C3: volume over \$1,500,000.....	25	35	29	18	6	12
All Group A firms.....	37	10	18	31	23	18
All Group B firms.....	36	15	22	19	29	15
All Group C firms.....	28	33	25	15	13	14
All Group 1 firms.....	36	13	27	15	21	24
All Group 2 firms.....	33	24	18	18	26	14
All Group 3 firms.....	30	26	23	28	15	8
Average, all firms.....	33	21	23	20	21	15

^a Averages of individual firm percentages.

so on). Net assets are a measure of the total capital resources used in the business.

Working capital is a necessary part of the normal business operation. It provides the balances needed for short-term cash outflows, inventory accumulations, and customer credit. It also provides a liquid reserve for unexpected contingencies. Working capital, however, is not a productive use of capital compared to fixed assets or investments, so no more capital than is necessary should be allocated to this use. Of the firms in this study, 7 percent had current assets that were less than current liabilities (Table 23). Such a situation is clearly unsatisfactory. The working capital of 23 percent of the firms was less than 20 percent of net assets; they too may have insufficient operating capital. But the 16 percent of the firms that had over 60 percent of their net assets in working capital may represent the opposite extreme of having too much working capital. In the firms with the largest proportion of grain to total sales, working capital was generally a smaller percent of net assets. Its relative importance did not seem consistently greater or smaller in the large firms as compared with the small firms.

Table 22. — Accounts Receivable, by Age; Group Averages

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Percent of accounts, average ^a			
	Under 3 months	3 to 6 months	6 to 12 months	Over 1 year
Group A: sales under 75 percent grain				
A1: volume under \$750,000.....	62	15	9	14
A2: volume \$750,000 to \$1,500,000.....	72	15	8	5
A3: volume over \$1,500,000.....	80	9	6	5
Group B: sales 75 to 89 percent grain				
B1: volume under \$750,000.....	64	15	8	13
B2: volume \$750,000 to \$1,500,000.....	58	16	15	11
B3: volume over \$1,500,000.....	68	14	10	8
Group C: sales 90 to 100 percent grain				
C1: volume under \$750,000.....	67	8	11	14
C2: volume \$750,000 to \$1,500,000.....	70	10	12	8
C3: volume over \$1,500,000.....	74	14	11	1
All Group A firms.....	71	13	8	8
All Group B firms.....	64	15	11	10
All Group C firms.....	71	11	11	7
All Group 1 firms.....	64	13	9	14
All Group 2 firms.....	66	13	12	9
All Group 3 firms.....	73	13	9	5
Average, all firms.....	68	13	11	8

^a Averages of individual firm percentages.Table 23. — Working Capital as Percent of Net Assets;^a Group Averages

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Aver- age ^b	Working capital as percent of net assets				
		under 0	0 to 19	20 to 39	40 to 59	60 and over
Group A: sales under 75 percent grain						
A1: volume under \$750,000.....	39	6	24	23	23	24
A2: volume \$750,000 to \$1,500,000.....	49	..	..	36	36	28
A3: volume over \$1,500,000.....	42	..	..	55	36	9
Group B: sales 75 to 89 percent grain						
B1: volume under \$750,000.....	25	7	29	35	29	..
B2: volume \$750,000 to \$1,500,000.....	39	4	12	34	27	23
B3: volume over \$1,500,000.....	31	10	26	37	11	16
Group C: sales 90 to 100 percent grain						
C1: volume under \$750,000.....	25	10	43	19	14	14
C2: volume \$750,000 to \$1,500,000.....	27	17	27	21	21	14
C3: volume over \$1,500,000.....	38	..	24	29	35	12
All Group A firms.....	43	2	10	36	31	21
All Group B firms.....	33	7	20	36	22	15
All Group C firms.....	29	11	31	22	22	14
All Group 1 firms.....	29	8	33	25	21	13
All Group 2 firms.....	36	9	17	29	25	20
All Group 3 firms.....	36	4	19	38	26	13
Average, all firms.....	34	7	23	30	24	16

^a Net assets are total assets minus current liabilities. Working capital is current assets minus current liabilities.^b Averages of individual firm percentages.

Fixed assets as a percent of net worth indicate the amount of invested capital or owner's equity that is used in fixed assets as related to the amount that is used in current operations as working capital or for other assets. For the average elevator, 80 percent of net worth was tied up in fixed assets (Table 24). The range, however, was wide. In 20 percent of the firms, fixed assets were less than 40 percent of net worth, while in 22 percent, fixed assets were over 100 percent of net worth. Fixed assets as a percent of net worth were higher in small firms than in large and higher in firms having the largest percent of grain to total sales.

Net assets may also be divided into net worth and noncurrent liabilities. The percent that net worth is of net assets indicates the relationship between invested capital (the owner's equity) and total capital resources used in the business. In the average firm, 87 percent of net assets was net worth and only 13 percent noncurrent liabilities (Table 25). Forty-two percent of the firms had no noncurrent liabilities; hence, net worth equaled net assets. But in 8 percent of the firms, net worth was less than 60 percent of net assets. Variations in this relationship among elevator groups were not highly consistent. The greatest proportion of firms whose net worth was less than 60 percent of their

Table 24. — Fixed Assets as Percent of Net Worth; Group Averages

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Average ^a	Fixed assets as percent of net worth			
		0 to 39	40 to 69	70 to 99	100 and over
Group A: sales under 75 percent grain		<i>perct. of firms</i>			
A1: volume under \$750,000.....	72	24	41	6	29
A2: volume \$750,000 to \$1,500,000..	53	36	46	18	..
A3: volume over \$1,500,000.....	42	36	55	9	..
Group B: sales 75 to 89 percent grain					
B1: volume under \$750,000.....	92	..	29	43	28
B2: volume \$750,000 to \$1,500,000..	73	27	27	31	15
B3: volume over \$1,500,000.....	82	16	21	37	26
Group C: sales 90 to 100 percent grain					
C1: volume under \$750,000.....	120	14	14	29	43
C2: volume \$750,000 to \$1,500,000..	92	14	31	24	31
C3: volume over \$1,500,000.....	60	24	41	29	6
All Group A firms.....	58	31	46	10	13
All Group B firms.....	80	17	25	36	22
All Group C firms.....	93	17	28	27	28
All Group 1 firms.....	97	13	27	25	35
All Group 2 firms.....	78	23	32	26	19
All Group 3 firms.....	65	23	36	28	13
Average, all firms.....	80	20	32	26	22

^a Averages of individual firm percentages.

Table 25. — Net Worth as Percent of Net Assets;^a Group Averages

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Aver- age ^b	Net worth as percent of net assets			
		under 60	60 to 79	80 to 99	100
Group A: sales under 75 percent grain			<i>perct. of firms</i>		
A1: volume under \$750,000.....	88	12	18	23	47
A2: volume \$750,000 to \$1,500,000..	95	..	9	36	55
A3: volume over \$1,500,000.....	91	..	18	46	36
Group B: sales 75 to 89 percent grain					
B1: volume under \$750,000.....	86	14	14	36	36
B2: volume \$750,000 to \$1,500,000..	88	8	12	38	42
B3: volume over \$1,500,000.....	85	5	21	58	16
Group C: sales 90 to 100 percent grain					
C1: volume under \$750,000.....	80	19	24	9	48
C2: volume \$750,000 to \$1,500,000..	87	10	17	21	52
C3: volume over \$1,500,000.....	88	..	35	24	41
All Group A firms.....	91	5	16	33	46
All Group B firms.....	86	9	15	44	32
All Group C firms.....	85	10	24	18	48
All Group 1 firms.....	84	16	19	21	44
All Group 2 firms.....	89	8	14	30	48
All Group 3 firms.....	88	2	25	43	30
Average, all firms.....	87	8	19	31	42

^a Net assets equal total assets minus current liabilities.^b Averages of individual firm percentages.

net assets, however, was in the group of small firms. The generally high ratio indicates a favorable financial position for most of the firms.

Noncurrent liabilities as a percent of fixed assets is a measure in some ways similar to the preceding one. This measure indicates the potential ability of a firm to borrow long-term funds, or alternatively, the margin of safety that exists for the present lenders of long-term funds. As previously noted, 42 percent of the firms had no noncurrent liabilities (Table 26). On the average, noncurrent liabilities were 19 percent of fixed assets; only 18 percent of the firms had noncurrent liabilities that were 40 percent or more of fixed assets. The relative importance of noncurrent liabilities was greater in the group of large firms than in the group of small firms. The low ratio for most firms indicates that additional long-term financing should not be difficult to obtain.

The measures discussed above are some of the most useful in evaluating the financial situation of a business. They can be used to indicate the financial strong or weak points. Final decision in the evaluation must be made, however, with reference to the special circumstances of the individual firm, because different standards are often applicable to different firms.

Table 26. — Noncurrent Liabilities as Percent of Fixed Assets; Group Averages

Firms classified by volume (total sales plus service income) and by percent that grain was of total sales (grain and merchandise)	Aver- age ^a	Noncurrent liabilities as percent of fixed assets			
		0	1 to 19	20 to 39	40 and over
Group A: sales under 75 percent grain			<i>perct. of firms</i>		
A1: volume under \$750,000.....	15	47	18	23	12
A2: volume \$750,000 to \$1,500,000..	11	55	9	36	..
A3: volume over \$1,500,000.....	26	37	18	9	36
Group B: sales 75 to 89 percent grain					
B1: volume under \$750,000.....	17	36	21	29	14
B2: volume \$750,000 to \$1,500,000..	18	42	19	23	16
B3: volume over \$1,500,000.....	22	16	37	21	26
Group C: sales 90 to 100 percent grain					
C1: volume under \$750,000.....	21	48	..	33	19
C2: volume \$750,000 to \$1,500,000..	15	51	14	21	14
C3: volume over \$1,500,000.....	30	41	12	24	23
All Group A firms.....	17	46	16	23	15
All Group B firms.....	19	32	25	24	19
All Group C firms.....	21	48	9	25	18
All Group 1 firms.....	18	44	12	29	15
All Group 2 firms.....	16	49	15	24	12
All Group 3 firms.....	26	30	23	19	28
Average, all firms.....	19	42	16	24	18

^a Averages of individual firm percentages.

COMPARISON OF IDENTICAL FIRMS, 1954-55 AND 1961-62

Data available from an earlier study permit the analysis of changes in 63 identical firms between the two periods 1954-55 and 1961-62. The firms are all in the northern part of the state, north of a line extended across the state from the southern boundary of Champaign County.¹

Between 1954-55 and 1961-62, total volume (total sales plus service income) increased by about 30 percent on the average (Table 27). Average grain sales in dollars increased 32 percent and increases occurred in about three-fourths of the firms; merchandise sales increased an average of 8 percent and increases occurred in slightly over half the firms; service income increased 176 percent and increases occurred in seven-eighths of the firms.

The larger sales volume generated larger profits. Average net operating income increased 47 percent, with increases occurring in about three-fourths of the firms. Net operating income increased relative to

¹ Because drouth conditions existed in southern Illinois in 1954, only firms in the northern half of the state were included in that study.

Table 27. — Selected Items of Income and Expense Compared;
63 Identical Firms, 1954-55 and 1961-62^a

Item	Average value ^b		Number of firms ^c		
	1954-55	1961-62	In- crease	No change	De- crease
Grain sales, bushels.....	470,699	757,706	50	..	6
Grain sales, dollars.....	779,906	1,027,504	47	..	16
Merchandise sales, dollars.....	174,829	189,008	36	2	25
Service income, dollars.....	15,803	43,558	55	..	8
Total sales plus service income, dollars.....	970,538	1,260,070	..	..	..
Net operating income, dollars...	20,774	30,557	48	..	15
Net operating income as percent of total sales plus service in- come.....	2.0	2.5	37	..	26
Net operating income as percent of net assets.....	13.3	12.6	28	..	35
Operating expenses as percent of total sales plus service income	4.8	6.5	54	1	8
Grain, gross income as percent of grain sales.....	3.1	3.0	40	3	20
Gross margins realized, cents per bushel					
Corn.....	3.2	3.0	16	3	34
Oats.....	4.0	3.1	20	1	32
Soybeans.....	6.7	6.1	18	..	34
Wheat.....	8.5	6.0	7	..	28
Merchandise, gross income as percent of sales					
Feed.....	10.5	13.9	29	..	4
Fertilizer.....	11.7	10.8	10	..	10
Seed.....	13.0	15.1	14	..	7
Coal.....	20.7	21.9	23	..	16
All merchandise.....	13.8	14.6	42	..	16

^a The 1954-55 data are special tabulations of some of the firms included in a study by R. J. Mutti, *Differences in the Financial Organization and Operation of Country Grain Elevators in the Northern Half of Illinois, 1954-55*. AERR-17, University of Illinois, College of Agriculture.

^b Average for the number of firms indicated in the right-hand three columns. Where a percent average is given, the average was calculated from individual firm percentages, not from dollar averages.

^c If the number of firms adds to less than 63, not all the firms reported the particular item.

business volume, from 2 to 2.5 percent of total sales plus service income, but decreased relative to investment, from 13.3 to 12.6 percent of net assets.

The increase in net operating income as related to sales volume occurred because of increases in merchandise margins, overall from 13.8 to 14.6 percent of merchandise sales, and probably most importantly, because of the increase in service income. The increase in net operating income occurred in spite of the facts that grain margins decreased from 3.1 to 3 percent of sales on the average, and that operating expenses increased from 4.8 to 6.5 percent of total sales plus service income.

Margins increased for feed, seed, and coal. The increase was particularly noticeable in feed, where 88 percent of the firms' margins increased, the average increasing from 10.5 to 13.9 percent. On the other hand, the average fertilizer margin decreased from 11.7 to 10.8 percent.

For most of the firms, grain margins per bushel decreased for each of the four grains. The average decrease was largest in wheat, from 8.5 to 6 cents, and smallest in corn, 3.2 to 3 cents.

Substantial changes occurred in the financial organization of the 63 identical firms. Fixed assets increased in all but one firm. The average firm's fixed assets in 1961-62 were over twice as large as in 1954-55 (Table 28). This change is also shown by fixed assets as a percentage of net worth; this increased from 46 to 67 percent.

Increasing amounts of long-term debt have become necessary to finance the expansion in fixed assets. Noncurrent liabilities increased in about half the firms. On the average, they increased from 8 to 15 percent of fixed assets.

Owners' equities increased in dollars, but not in relation to the total capital structure. Increases occurred in dollar net worth in all but one firm, the average increase being 54 percent, but net worth decreased from 96 to 90 percent of net assets.

Table 28. — Financial Organization Compared; 63 Identical Firms, 1954-55 and 1961-62^a

Item	Average value ^b		Number of firms ^c		
	1954-55	1961-62	In-crease	No change	De-crease
Fixed assets, dollars.....	61,177	134,523	62	..	1
Noncurrent liabilities, dollars.....	7,060	25,610	31	27	5
Net worth, dollars.....	134,059	205,918	62	..	1
Net assets, dollars.....	141,119	231,528	..	..	..
Noncurrent liabilities, percent of fixed assets.....	7.6	15.4	28	27	8
Fixed assets, percent of net worth.....	46.0	67.3	52	..	11
Net worth, percent of net assets..	95.7	89.7	7	27	29
Current assets divided by current liabilities.....	4.6	2.8	21	3	38
Receivables, percent of current assets.....	30.1	32.3	35	..	28
Accounts receivable, age; percent					
Less than 3 months.....	60.0	66.4	13	..	5
3 to 6 months.....	20.1	14.1	3	..	15
6 to 12 months.....	14.2	11.4	6	..	12
Over 1 year.....	5.7	8.1	12	3	3

^a For source of 1954-55 data, see footnote a, table 27.

^b Average for the number of firms indicated in the right-hand three columns. Where a percent average is given, the average was calculated from individual firm percentages, not from dollar averages.

^c If the number of firms adds to less than 63, not all the firms reported the particular item.

Liquidity decreased somewhat, as the average current ratio dropped from 4.6 to 2.8; a decrease occurred in more than half the firms. Accounts receivable increased slightly as a percent of current assets. The distribution of accounts receivable by age reflected two different types of changes, as both the newest accounts, less than 3 months, and the oldest, over 1 year, increased somewhat in importance.

COMPARISON OF ALL FIRMS, 1949-50, 1954-55, AND 1961-62

It is also possible to compare the average results of studies in three periods, 1949-50, 1954-55, and 1961-62. Only 32 firms were identical in all three years, although the 63 firms just discussed were identical in 1954-55 and 1961-62. Since different firms were included in the different studies, any conclusions about general changes during the period must be made cautiously.

The business volume (total sales plus service income) of the average firm was 50 percent larger in 1961-62 than in 1954-55, but increased only slightly between 1949-50 and 1954-55 (Table 29). Increases occurred in all categories—grain and merchandise sales and service income—with the average of service income jumping from \$8,323 in 1949-50 to \$38,384 in 1961-62.

Net income in dollars was highest in 1961-62, but as related to both business volume and investment, was highest in 1949-50 and lowest in 1961-62. Operating expenses as a percent of total sales plus service income increased from a low in 1949-50 to a high in 1961-62.

Corn and soybean margins per bushel were highest in 1949-50 and lowest in 1961-62, while wheat and oats margins were highest in 1954-55. Total merchandise, feed, seed, and coal margins increased from 1949-50 lows to 1961-62 highs, but fertilizer margins decreased throughout the period.

Fixed assets as a percent of net worth changed little between 1949-50 and 1954-55, but increased greatly between 1954-55 and 1961-62. Non-current liabilities as a percent of fixed assets increased steadily during the period, while net worth as a percent of net assets decreased steadily. The current ratio was constant in the first two periods, but dropped in 1961-62.

The changes noted between 1954-55 and 1961-62 for all firms were similar in nature to those noted for identical firms. The changes between 1954-55 and 1961-62 were generally of greater magnitude than those that occurred between 1949-50 and 1954-55.

Table 29.—Selected Items of Income and Expense, and of Financial Organization Compared; All Firms Studied, 1949-50, 1954-55, and 1961-62^a

Item	1949-50	1954-55	1961-62
Number of firms.....	158	179	168
Grain sales, bushels.....	506,863	440,856	742,993 ^b
Grain sales, dollars.....	688,059	694,031	1,027,226
Merchandise sales, dollars.....	136,148	144,930	217,967
Service income, dollars.....	8,323	13,682	38,384
Total sales plus service income, dollars.....	832,430	852,643	1,283,577
Net operating income, dollars.....	19,467	16,064	27,423
Net operating income as percent of total sales plus service income ^c	2.3	1.9	2.1
Net operating income as percent of net assets ^c	19.2	12.0	11.6
Operating expense as percent of total sales plus service income ^c	3.9	4.6	6.4
Median gross margins realized, cents per bushel			
Corn.....	3.9	3.3	2.9
Oats.....	3.4	3.7	2.9
Soybeans.....	6.3	6.1	5.6
Wheat.....	4.6	6.9	5.8
Merchandise, gross income as percent of merchandise sales ^c	13.4	14.7	16.1
Median gross margin as percent of sales			
Feed.....	10.1	10.9	13.6
Fertilizer.....	11.8	11.5	11.3
Seed.....	11.7	12.4	13.4
Coal.....	15.8	19.2	21.1
Lumber and building materials.....	19.5	17.8	19.1
Noncurrent liabilities, as percent of fixed assets ^c	5.6	13.4	24.7
Fixed assets as percent of net worth ^c	46.8	44.8	70.5
Net worth as percent of net assets ^c	97.5	94.3	85.2
Current assets divided by current liabilities ^c	2.3	2.3	1.8

^a The 1949-50 data cover accounting years ending from October 1949 to August 1950 and are taken from R. J. Mutti, C. P. Schumaier and L. F. Stice, *Business Analysis of Country Grain Elevators in Illinois, 1949-50*, AE-2821, University of Illinois, College of Agriculture.

The 1954-55 data refer to accounting years ending from September 1954 to September 1955 and are taken from R. J. Mutti, *Differences in the Financial Organization and Operation of Country Grain Elevators in the Northern Half of Illinois, 1954-55*, AERR-17, University of Illinois, College of Agriculture.

The 1961-62 data are from this report and refer to accounting years ending from July 1961 to June 1962.

The firms referred to in the three years are not identical.

^b This estimate for all firms was based on the ratio of dollar to bushel sales for the 138 firms where bushel sales were known.

^c Calculated from total dollar figures, not from individual firm percentage figures. This was done for purposes of comparison, but resulted in averages different from those presented elsewhere in this report.

SUMMARY AND CONCLUSIONS

Statistics presented in this study were taken from the accounting records of 168 Illinois country grain elevator firms and covered fiscal years ending any month from July 1961 to June 1962.

In the average firm, 1961-62 grain sales amounted to \$1,027,226; merchandise sales, \$217,967; service income, \$38,384; operating expenses, \$82,317; net operating income, \$27,423; and net income, \$26,188. For 138 firms with bushel data available, corn represented 61 percent of bushel sales, soybeans 21, wheat 11, and oats 7 percent. Of merchandise sales, 34 percent was feed, 16 fertilizer, and 12 percent petroleum products. Of service income, CCC storage and handling accounted for 59 percent; grinding, mixing, and storage for farmers were other important items.

A linear multiple regression analysis indicated that in the firms studied, net operating income (return on capital used plus pure profit) increased 0.9 cent for every \$1.00 increase in grain sales, 5.3 cents for every \$1.00 increase in merchandise sales, and 37.9 cents for every \$1.00 increase in service income. On the average, net operating income was 2 percent of total sales plus service income, 11 percent of net assets (total assets minus current liabilities) and 13.2 percent of net worth. Although there were wide variations among individual firms, the average percent return to capital was considerably greater in the large firms than in the small firms.

Grain margins realized varied widely among firms, with medians of 2.9 cents per bushel for corn and oats, 5.6 cents for soybeans, and 5.8 cents for wheat. Margins were highest in the southern and northern extremes of the state, somewhat lower in the western portion and lowest in the east-central and Illinois River areas.

For all merchandise, the median margin was 14.8 percent of sales; for feed, it was 13.6 percent, for fertilizer, 11.5 percent, seed, 13.4, and coal, 21.1 percent. Merchandise margins averaged higher in firms with larger percentages of total sales from merchandise, but they did not appear to be related to sales volume.

Operating expenses averaged 6.4 percent of total sales plus service income. Of the total, 52 percent were management and labor expenses and 41 percent were physical plant expenses. A linear multiple regression analysis indicated that in the firms studied, operating expenses increased 2.8 cents for every \$1.00 increase in grain sales, 14.3 cents for every \$1.00 increase in merchandise sales, and 62.6 cents for every \$1.00 increase in service income. Ratios of expense to sales volume

averaged lower for the larger firms, indicating the possibility of economies of scale or size, but again there were considerable variations among individual firms.

In the average firm, assets were \$330,530, of which \$129,119 were liabilities and \$201,411 were net worth. Fixed assets equaled 80 percent of net worth on the average, and net worth averaged 87 percent of net assets. The average current ratio (current assets divided by current liabilities) was 2.7:1, but half of the firms had current ratios below what is often considered the minimum standard, 2:1. Accounts receivable averaged 33 percent of current assets. About two-thirds were under 3 months of age, but 8 percent were older than 1 year. Working capital (current assets minus current liabilities) averaged 34 percent of net assets, with 7 percent of the firms having negative working capital. Noncurrent liabilities averaged 19 percent of fixed assets, indicating considerable latitude for more long-term financing.

Comparisons were made between 63 identical firms studied in 1954-55 and 1961-62, and between the averages for 160 to 180 firms (not necessarily identical) studied in those two years and 1949-50. The comparisons indicated that grain elevator firms have sharply increased their grain and merchandise sales and their service incomes in the post World War II period. Net operating income increased in dollars but decreased both as a percent of business volume (total sales plus service income) and as a percent of total capital (net assets). Gross grain margins per bushel have decreased and operating expenses as a percent of business volume have increased. These profit-depressing factors have been partially offset by increases in gross margins per dollar of merchandise sales and increases in the amount of service income.

Substantial changes have occurred in financial structure. The amount of capital required, particularly in fixed assets, has increased greatly. More long-term financing has been required, and owners' equities as proportions of total capital have declined. Liquidity as indicated by the current ratio has decreased. Changes in financial structure were more drastic between 1954-55 and 1961-62 than between 1949-50 and 1954-55.

An important finding about the 1961-62 operations is that there were wide variations in the relationships found among the different factors. For example, at any given level of business volume (total sales plus service income), there were wide variations in operating expenses and

net operating income, even for firms with similar proportions of grain and merchandise sales and service income. Even where statistically significant relationships were found, considerable portions of the variations were not explained.

In part, the apparent lack of close relationships is due to difficulties in data preparation and analysis. Discrepancies or lack of uniformity in the data arose from bookkeeping errors, differences in accounting techniques, and so forth. Uniform comparisons among firms are always difficult, because each firm is an individual case with a unique combination of products, services, resources, and so on. The groupings of similar firms that were used in this study alleviated the problem somewhat.

In large part, however, the variations are to be expected, because they reflect differences in managerial ability. With other factors held equal, different managers will still get different operating results from similar resources. Many of the differences noted in this study are probably due to different levels of management performance.

The facts contained here should help individual managers appraise their recent performance and perhaps improve it in the future. Good management has two general aspects. One is to get the best operating results from the given resources; that is, to maximize net income with the given plant and equipment, available labor, potential trade volume, and so on. The other is to determine the best long-run organization of resources, such as what type of plant will be best in the long-run and what proportion of various enterprises the firm should aim toward. Firms that are aware of both of these goals and successful in their accomplishment will endure and prosper.





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